

# Agreement Target Situations \*

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## Abstract

We analyze number agreement in English in the version of Situation Semantics I put forth in [1]. We propose two theoretical notions, *agreement target situations* and *relevance of situations*. We propose that *structural constraints* shift the former in a way governed by the latter. Our analysis shows that number agreement reflects our knowledge about the structure of the world and the speaker's interests in the discourse.

## 1 Introduction

In [1] I put forth a situation-semantic theory of plurality and other phenomena. The purpose of the present paper is to construct a particular application of the above theory to number agreement in English.<sup>1</sup> After briefly surveying and augmenting [1] (section 2), we propose two theoretical notions, *agreement target situations* and *relevance of situations*, with which we analyze number agreement in English. We propose that *structural constraints* shift agreement target situations in a way governed by the relevance of situations. After introducing these mechanisms (section 3), we discuss examples where the subjects are plural in number but the verbs exhibit singular agreement (section 4). Our analysis will lead us to the conclusion (section 5) that number agreement reflects our knowledge about the structure of the world and the speaker's interests in the discourse.

## 2 Theoretical Backgrounds

In [1], lattice-theoretic structure of atomic and non-atomic individuals ([2]) is relativised to situations (see also [3]). Thus, something may be atomic in one situation and non-atomic in another. For example, in (1), let  $X$  be the subject's referent,  $r$  be the resource situation of the subject, and  $s$  be the described situation of the whole sentence.

- (1) Two boys annoyed Carol.

$X$  is non-atomic in  $r$ . Whether (1) is read collectively or distributively depends on whether  $X$  is non-atomic in  $s$  too.

However, as it stands this analysis has one flaw. Suppose that (2) obtains. We will want to say that  $X$  is plural (non-atomic) in  $s$ , i.e.  $X$  has members in  $s$ . Let  $x_1$  be one of these members. Then, [1] would predict that (3) follows from (2), which is clearly undesirable.

(2)  $s \models \ll \text{people}, X \gg$

(3)  $s \models \ll \text{people}, x_1 \gg$

We augment [1] by extending lattice structures to *infons*. For example, in order for (5) to be a *resolution* of (4), it is not necessarily required that  $P_1, \dots, P_n = P$ ; when it isn't the case that  $P_1, \dots, P_n = P$ , whether (5) counts as a resolution of (4) depends on what  $P_1, \dots, P_n$  and  $P$  are.

(4)  $s \models \ll P, X \gg$

(5)  $s \models \ll P_1, x_1 \gg, \dots, s \models \ll P_n, x_n \gg$   
 where  $x_1, \dots, x_n$  are the members of  $X$  in  $s$ .

(2) is to be resolved to (6) (a **people** infon is the sum of a set of **person** infons whose person arguments are different from each other); (3) then doesn't follow from (2).

(6)  $s \models \ll \text{person}, x_1 \gg, \dots, s \models \ll \text{person}, x_n \gg$

Examples like the following (from [4]) could complicate the infon lattice structure.

(7) a. Your problem and mine are similar.

b. Your problem is similar to mine and mine is similar to yours.

In (7a), we have  $s \models \ll \text{similar}, X \gg$ . Although our theory doesn't necessarily require this, but assume that  $X$  is the sum of  $x_1$  and  $x_2$  in  $s$ . Then we could say that  $\ll \text{similar}, X \gg$  is the sum of  $\ll \text{similar-to}, x_1, x_2 \gg$  and  $\ll \text{similar-to}, x_2, x_1 \gg$  in  $s$ . That is, both (7a-b) are statements about  $s$ .<sup>2</sup>

Now, when we want to say that a given expression  $X$  agrees with something else  $Y$  in number, we first have to choose a situation in order to decide  $Y$ 's number specification for agreement purposes. This question motivates our first proposed notion, *agreement target situation*.

### 3 Agreement Target and Target Transfer

Let's say  $Y$ 's referent is atomic in  $s_1$  and non-atomic in  $s_2$ . Suppose  $X$  agrees with  $Y$  in number. If we choose  $s_1$ , we will get singular agreement, in which case we say  $s_1$  is the *agreement target situation* (hereafter, abbreviated as *agreement target*, or *ATS*). That is,  $Y$  provides  $s_1$  to  $X$  so that  $X$  agrees with the number specification of  $Y$  in  $s_1$ . In contrast, if we choose  $s_2$ , we will get plural agreement, in which case we call  $s_2$  the *ATS*.

Since we distinguish the subject's resource situation from the described situation of the whole sentence, the first question to be asked is: which is to serve as the ATS, in general? In [1], the overt number specification of the subject mirrors the (non-)atomicity in the resource situation, whereas the (non-)atomicity in the described situation mirrors the collective/distributive distinction (where "distributive" encompasses cases such as *They are nice people*, where  $\text{people}(X)$  "distributes" to  $\text{person}(x_i)$ , for  $1 \leq i \leq n$ ). Then, according to the conventional "subject-verb agreement" locution, the resource should be the ATS, a natural position that we take.

This already gives us a straightforward account of (8).

(8) Ken and Naomi are/\*is a nice couple.

Let  $X$  be the subject's referent. The point is that the overt form of the subject dictates that  $X$  is non-atomic, whereas the postcopular phrase overtly dictates that it is atomic, which is a contradiction. This puzzle is resolved in our analysis. (8) says something like (9), where  $X$  comes with the restriction (10).<sup>3</sup>

(9)  $s \models \ll \text{nice}, X \gg \oplus \ll \text{couple}, X \gg \oplus \ll \text{one}, X \gg$

(10)  $r \models \ll \text{members}, \{K, N\}, X \gg$

$s$  is the described situation, which is  $X$ 's *couple* situation (see [1]), while  $r$  is the subject's resource situation. Since  $X$  has the property of being 'one' in  $s$ , it can't have members in  $s$  (i.e.  $X$  is a single entity *as a couple*; again, see [1]). In contrast,  $X$  does have members in  $r$ ; nothing forces  $s$  to inherit  $X$ 's membership from  $r$  or  $r$  to inherit  $X$ 's atomicity from  $s$ .

However, things are not this simple, in fact. Consider (11) from [6].

(11) The couple is/are spending its/their honeymoon in Hawaii.

The first point to be noted is that plural subject-verb agreement is possible even when the subject's referent is atomic in its resource situation.<sup>4</sup> If our last word was that the subject's resource situation serves as the ATS, then we would end up wrongly excluding this possibility. The obvious reason why *are* is possible here is that any couple consists of two people. The second point to be noted is that the subject-pronoun agreement has to coincide with the subject-verb agreement; when you choose *is*, you have to choose *its*, but when you choose *are*, you have to choose *their*.<sup>5</sup>

We propose that *structural constraints* shift agreement target situations. For example, the relevant constraint here is something like the following.<sup>6</sup>

(12)  $(s_1 \models \ll \text{couple}, x \gg) \implies (s_2 \models \ll \text{members}, x, \{x_1, x_2\} \gg)$

In general, given a structural constraint of the form:

(13)  $(s_1 \models p) \implies (s_2 \models q)$

and that the resource situation of the subject of a sentence is  $s_1$ , (13) shifts the ATS from  $s_1$  to  $s_2$  so that the verb agrees with the number specification of the subject's referent in  $s_2$  instead of in  $s_1$ , but this occurs only when  $s_2$  is conceived as a *relevant situation* in the discourse.

Now, consider (11). The subject's resource situation corresponds to  $s_1$  in (12). First, suppose that  $s_2$  is relevant. Then (12) shifts the ATS from  $s_1$  to  $s_2$ , in which case we observe plural agreement. Next, suppose that  $s_2$  is not relevant. Then (12) isn't "activated" to shift the ATS, in which case  $s_1$  is the ATS and we observe singular agreement. This is our expression of the intuition [4] that, in the case of collective nouns, the choice between singular and plural agreement "is based, if on anything, on whether the group is being considered as a single undivided body, or as a collection of individuals" (p.177). In our formulation, *the couple* is always conceived as a single entity; the difference resides in whether its membership aspect is relevant or not.

In general, it is intuitive to say that the described situation of the whole clause is relevant; thus, when  $s_2$  and the described situation can be identified, ATS shift becomes obligatory. Then, we predict that (11) exhibits plural agreement if something like *Ken is spending his honeymoon in Hawaii* and *Naomi is spending her honeymoon in Hawaii* are also facts in the described situation (i.e. if the couple's honeymoon-spending is the sum of Ken's honeymoon-spending and Naomi's); in contrast, if (11) exhibits singular agreement then the couple is atomic in the described situation.<sup>7 8</sup>

Further, the coincidence of verbal agreement and pronominal agreement follows. In (12), the described situation, which is identified with  $s_2$  in (13), is the same throughout the whole clause. Then,  $s_2$  is either relevant throughout the clause or irrelevant throughout the clause; then, shift occurs throughout or doesn't occur throughout.<sup>9</sup>

Also note that ATS shift can occur only in the direction dictated by a constraint. For example, let  $X$  be a couple. ATS shift is possible from  $X$ 's couple situation to its membership situation (the member's individuals situation), as in (11), because we have the constraint (12) saying that  $X$ 's being a couple means  $X$ 's having two persons as its members. But shift in the other direction is not possible; that's why, in (8), we can't shift the ATS from the subject's resource situation to Ken and Naomi's couple situation and make the copula exhibit singular agreement.

## 4 Discussion

[8] notes that the collective/distributive distinction correlates with number agreement. For example, they note that the plural agreement example (14a) possesses distributive reading that is unavailable with (14b).

- (14) a. Unleashed dogs on city sidewalks threaten the health and welfare of law-abiding citizens.

- b. Unleashed dogs on city sidewalks threatens the health and welfare of law-abiding citizens.

This might seem to suggest that ATS is obligatory in such cases. However, we have no obvious constraint in examples like (14). Further, even if we stipulated some constraint, it would be unclear why the consequent situation always has to be relevant in such cases (so that ATS shift becomes obligatory and the number agreement coincides with the collective/distributive distinction), while this is not the case in examples like (15).

- (15) Kim and Sandy are/\*is carrying the piano upstairs (together).

In fact, the accounts I suggest for examples like (14) are independent not only from structural constraints but also from ATS shift. In other words, in examples like (14), no ATS shift is involved and the resource situations serve as the ATS.

The account I suggest for (14) is very simple. In (14a), *dogs* is the head of the subject, and hence, we observe plural agreement. However, in (14b), *in*, not *dogs*, is the head; in other words, the subject of (14b) is in fact a so-called *small clause* (in [8]'s framework, *on* in (14b) is P[+PRD]). Then, the subject of (14b) is singular in the resource situation; it denotes an infon or a proposition, and hence, it is only natural that we observe singular agreement and that it is read collectively. Note that this account also accounts for (16) (also from [8]), where the subject can't be analyzed as a small clause by any means and hence plural agreement is required.

- (16) \*Raccoons is getting to be a problem in this neighborhood.

Further I assume that, when we say that something A can threaten something B, we mean that A is threatening because it is A. With this in mind, I assume that the resource situations of the subjects are part of the described situations in (14a–b) (in contrast, in examples like (15), the subject's resource situations do not necessarily have to be part of the described situations). This means that the referent of (14a)'s subject is plural not only in the resource but also in the described situation; this is why (14a) is read distributively.<sup>10</sup>

Another example [8] uses to motivate the correlation is (17), where we observe similar interpretational difference to (14) (see also [3], p.478, fn.7).

- (17) a. Doing phonology problems and drinking vodka make me sick.  
b. Doing phonology problems and drinking vodka makes me sick.

Interestingly, this pair could be used as an attack to [8]'s own framework (which doesn't assume PRO) and own claim that agreement is not syntactic, for we could analyze (17a–b) as (18a–b) respectively; the subject of (18a) is a coordination of two clauses while that of (18b) is a single clause (this

analysis assumes that the crucial reason for the contrast in (17) is that the subjects are “property-denoting” expressions).<sup>11</sup>

- (18) a. [[PRO doing phonology problems] and [PRO drinking vodka]  
make me sick.
- b. [PRO [doing phonology problems and drinking vodka]]  
make me sick.

Then, Pollard and Sag should have shown that this analysis is not a real solution to the contrast in (17) (otherwise it could be used as a support for assuming PRO and that agreement is syntactic).

I suggest that, in fact, the above syntactic analysis is not a real solution. My suggestion is that the real crucial factor is that the subjects of (17a–b), which are coordinated VP’s (or S’s if PRO is to be assumed; see below), count as *abstract nouns*. That is, the real observational generalization is that coordinated abstract nouns allow singular/plural alternation and the alternation correlates with the collective/distributive distinction. This generalization covers the similar interpretational contrast in examples like (19) ([3]), for which nobody would assume PRO.<sup>12 13</sup>

- (19) Peanut butter and jelly is/are good for making sandwiches.

Thus, the PRO analyses (18a–b) are not the right solution to the contrast in (17a–b).

Here, I assume the following constraint.<sup>14</sup>

- (20)  $(s_1 \models \langle\langle \text{non-atomic}, X \rangle\rangle) \implies (s_2 \models \langle\langle \text{atomic}, X \rangle\rangle)$   
where  $X$  is the sum of the referents of abstract nouns.

(20) says that if there is a sum of two or more abstract things in some situation, then this sum can show up as a single complex thing in another situation. We could say that (20) is a stipulation, but it explains both (17) and (19) uniformly. For example, let  $X$  be the sum of *doing phonology problems* and *drinking vodka*. In (17),  $X$  is non-atomic in the subject’s resource situation  $s_1$ . Now, if  $X$  is atomic in the described situation, in which case the sentence is read collectively,  $s_2$  can be equated with the described situation and hence ATS is shifted; thus, we observe singular agreement. On the other hand, if  $X$  is non-atomic in the described situation, then we are talking about its non-atomic aspect, and hence,  $s_2$  is irrelevant. Thus, ATS doesn’t shift, and we observe plural agreement. Similarly for (19).<sup>15</sup> Also note that coordinated sentential subjects also follow this pattern, as the following examples from [14] (p.110) show (if PRO is to be assumed this is expected from our analysis of (17)).

- (21) a. That the price of gas went up and that the price of gold went down  
isn’t surprising.

- b. That the price of gas went up and that the price of gold went down aren't surprising.

For the contrast in (21), we only have to assume that sentential subjects also count as abstract nouns, while the PRO analysis<sup>16</sup> has nothing to say about this.

In this connection, consider the following example from [3].

- (22) Reading and writing at the same time is/\*are hard work.

The point is that *at the same time* forces both collective reading and singular agreement. The explicit semantics of such adjuncts is beyond the scope of this paper, but at least we will have to say anyway that, while it forces us to talk about *reading and writing* as a single activity (that is, about its singular aspect), we also have to ensure that it can't attach to expressions denoting "atomic" activities or events; thus, it doesn't seem enough simply to say that *reading and writing* is conceived as a single activity or events.

Instead of writing a separate structural constraint, I suggest here that the semantic value of *at the same time* itself incorporates the above requirements. That is, its semantic contribution is to operate on such constraints as (20), in which *X* is non-atomic in the antecedent, and raise the relevance of  $s_2$  in (20).

## 5 Conclusion

The crucial ingredients of our analysis of number agreement are [1]'s idea that number specification is relative to situations and that structural constraints can shift agreement target situations. Further, target shift is constrained by the relevance of situations, which often mirrors the collective/distributive distinction. Now, structural constraints represent our knowledge about the structure of the world, and relevance of situations are reflections of the speaker's interests in the discourse. Thus, our analysis claims that number agreement reflects our knowledge and interests.<sup>17</sup>

## Notes

\*I would like to thank Bill Ladusaw (for his native judgments on some of the examples) and Wataru Nakamura (for helping with obtaining another speaker's native judgments on other examples).

<sup>1</sup>We follow [1] in distinguishing (in)definite descriptions from generalized quantifiers. We ignore the latter throughout in this paper.

<sup>2</sup>Cf. Dowty's characterization of the semantic effect of *all* mentioned on p.154 of [5].

<sup>3</sup>The semantic contribution of the adjective *nice* is situated in *X*'s couple situation. This means that *X* is said to be nice as a couple. Similarly, *one* is situated, meaning that *X* is a single entity as a couple. See [1]).

<sup>4</sup>This point can be more clearly seen in the following examples from [7].

(i) a. \*These term is/are going to win.

b. This team is/are going to win.

The determiner has to be singular, whereas the verb can be either singular or plural (I don't discuss the analysis by [7], only parts of which I have a copy of).

<sup>5</sup>Similar examples are found on p.87 of [8].

<sup>6</sup>Those readers who want to regard structural constraints as relations between *situation types* can assume that (12) is "generated" by a structural constraint conceived as a relation between situation types.

<sup>7</sup>Then, our collective/distributive distinction doesn't cover the whole range of logically valid inferences in the classical sense. Note that a situation doesn't necessarily contain every fact there is, by definition ([5] exhibits a similar conception of "collective reading").

<sup>8</sup>Similarly, (i) is bad probably because the couple's membership situation (i.e.  $s_2$  in (13)) is identified with the described situation.

(i) \*The couple is nice people.

On the other hand, (ii) is not good either (at least) to American speakers.

(ii) The couple are nice people.

Probably this is due to the well-known difference between American and British varieties of English. The dialectal difference probably means that American speakers don't accept ATS shift as readily as British speakers, while the theory requires ATS shift (both (i) and (ii) are not good for American speakers). However, without British informants, I can't say something definite here (note that even in American English singular/plural alternation occurs (cf. [8], p.70)).

<sup>9</sup>When I say that a pronoun agrees with its antecedent, I implicitly assume my own analysis ([9] and [10]; see also [11]) of pronouns as definite descriptions. If we follow this analysis, then a pronoun exploits its antecedent's ATS as its own resource situation (with [11], things will get more complicated). However, assumption of such an analysis is not crucial here.

<sup>10</sup>Here, some readers might be reminded of the following examples from [12].

(i) a. Three defeats in a row was too much for our hero.

b. The defeats were/\*was too much for our hero.

(ii) a. Hundred dollars is a lot of money for a TV dinner.

b. Those hundred dollars are/\*is a lot, though.



Our accounts for the contrast between (14) and (16) extends to (ia–b). As for (iia), one obvious thing to say is that the subject is interpreted as an amount. There will be several possible analyses for this (e.g. it could be a subtle type of *reference transfer*, or we could assume a constraint saying that *n* dollar bills in a situation can show up as an amount in another situation, or we could assume its quasi-bare-plural status of the subject or its status as a complex proper name (cf. [13]), etc.). I don't pursue this issue further here.

<sup>11</sup>Based on this assumption one could construct an alternative, “semantic” version of this analysis and say that the semantic values of the subjects of (17a–b) are (ia–b) respectively.

- (i) a.  $\lambda x$  [doing-phonology-problems(*x*)]  $\oplus$   $\lambda x$  [drinking-vodka(*x*)]
- b.  $\lambda x$  [doing-phonology-problems(*x*)  $\oplus$  drinking-vodka(*x*)]

Our attack on the “syntactic” PRO analysis applies to this “semantic” version too.

<sup>12</sup>Or its “semantic” version noted in n. 11.

<sup>13</sup>Cf. [8]’s example (i).

- (i) Steak and okra makes me sick.

<sup>14</sup>Probably this constraint is peculiar to English. In other languages non-abstract nouns may be subject to similar constraints (see [7], p. 127, for a Finnish example taken from a paper by Edith A. Moravcsik).

<sup>15</sup>For [8], (15)–(16) are simply “remaining puzzles” (p.87, fn.22). Also note that [8] simply says that the subjects of (14b) and (17b) acquire singular indices without specifying how.

<sup>16</sup>Or its “semantic” version noted in n.11.

<sup>17</sup>I don't claim to have solved every problem about number agreement in English (for example, I have nothing to say here about linear order, *there*-construction, etc.). One of the remaining puzzles is the contrast, already noted in a footnote in [1], between (8) and (i).

- (i) Ken and Naomi are/is a good group.

That is, singular agreement is also possible when the postcopular noun is *group*. At present I have no interesting solution to this puzzle.

## References

- [1] K. Ishikawa. “Situating Groups.” In A. Ishikawa and Y. Nitta (eds.) *The Proceedings of the 1994 Kyoto Conference: A Festschrift for Akira Ikeya*, 21–30, Tokyo: The Logico-Linguistic Society of Japan, 1995.

- [2] G. Link. "The Logical Analysis of Plurals and Mass Terms." In R. Bäuerle, C. Schwarze and A. von Stechow (eds.) *Meaning, Use, and Interpretation of Language*, 302–323, Berlin: Walter de Gruyter, 1983.
- [3] R. W. Langacker. *Foundations of Cognitive Grammar, vol.2: Descriptive Applications*, Stanford: Stanford University Press, 1991.
- [4] R. Quirk and S. Greenbaum. *A University Grammar of English*. London: Longman, 1973.
- [5] C. Roberts. *Modal Subordination, Anaphora, and Distributivity*. New York: Garland, 1990.
- [6] T. Konishi (ed.). *Taishukan's Genius English-Japanese Dictionary*. Tokyo: Taishukan, 1988.
- [7] M. Barlow. *A Situated Theory of Agreement*. Ph.D. dissertation, Stanford University, 1988.
- [8] C. Pollard and I. Sag. *Head-Driven Phrase Structure Grammar*. Chicago: University of Chicago Press, 1994.
- [9] K. Ishikawa. "Individuation and Reasoning." To appear in E. Engdahl, J. Etchemendy, J. Seligman, H. Sirai and D. Westerståhl (eds.) *Language, Logic and Computation: The 1994 Moraga Proceedings*, Stanford: CSLI, In press.
- [10] K. Ishikawa. *A Network Theory of Reference*. Ph.D. dissertation, University of Tokyo, 1995.
- [11] K. Ishikawa. "Crosslinguistic Notions of (In)definiteness." This volume.
- [12] J. Hoeksema. "Plurality and Conjunction." In A. G. B. ter Meulen (ed.) *Studies in Modeltheoretic Semantics*, 63–83, Dordrecht: Foris, 1983.
- [13] G. N. Carlson. *Reference to Kinds in English*. New York: Garland, 1980.
- [14] J. D. McCawley. (1988) *The Syntactic Phenomena of English, vol.1*. Chicago: University of Chicago Press.